

**ABSTRACT**

An optical logic circuit is disclosed. The optical logic circuit is configured on a substrate of a first material. The optical logic circuit also has an optical layer which overlays the substrate layer and is at least partially configured of a second material. The optical layer is patterned to provide a plurality of optical pathways. At least one of the optical pathways transmits an optical bias and at least one optical pathway is configured to provide an optical input and at least one optical pathway is configured to provide an optical output. The optical pathways are configured to provide a Boolean logic output based on the at least one optical input.

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